

CLAIMS

What we claim is:

- 1 1. A method for utilizing a self-similarity technique to process an image comprising:
 - 2 obtaining a corrupted image;
 - 3 altering the corrupted image to obtain an altered image;
 - 4 determining a plurality of parameters of a parametric mapping operator for
 - 5 mapping the altered image into the corrupted image; and
 - 6 utilizing the plurality of parameters to map the corrupted image into an output
 - 7 image.

- 1 2. The method of claim 1 wherein the process comprises a de-echoing process and
2 the act of altering the corrupted image further comprises:
 - 3 creating echoes of the corrupted image.

- 1 3. The method of claim 1 wherein the process comprises a de-blurring process and
2 the act of altering the corrupted image further comprises:
 - 3 creating a blur of the corrupted image.

- 1 4. The method of claim 2 wherein the act of creating echoes of the corrupted image
2 further comprises:
 - 3 convolving the corrupted image with a plurality of pulses wherein each of the
 - 4 pulses are separated by a number of pixels.

- 1 5. The method of claim 4 wherein the number of pixels comprises only one pixel.

- 1 6. The method of claim 4 wherein the act of utilizing the plurality of parameters
2 comprises:

3 adding to each of the number of pixels a multiplication of a strength factor by a
4 combination of values associated with a plurality of neighboring pixels.

1 7. The method of claim 6 wherein the strength factor is a fixed scalar.

1 8. The method of claim 6 wherein the strength factor depends on parameters used by
2 an image acquisition device when obtaining the corrupted image wherein the parameters
3 used by the image acquisition device comprise at least one of an out of focus distance, an
4 acquisition resolution or an optical system characteristic.

1 9. The method of claim 6 wherein the act of determining a plurality of parameters of
2 a parametric mapping operator comprises:

3 calculating at least one similarity value for each of the neighboring pixels; and
4 utilizing the at least one similarity value to produce at least one of the plurality of
5 parameters.

1 10. The method of claim 4 wherein the number of pixels is obtained by at least one of
2 an image acquisition device or an image acquisition device manufacturer.

1 11. The method of claim 4 wherein the number of pixels depends on parameters used
2 by an image acquisition device when obtaining the corrupted image wherein the
3 parameters used by the image acquisition device comprise at least one of an out of focus
4 distance, an acquisition resolution or an optical system characteristic.

1 12. A system for utilizing a self-similarity technique to process an image comprising:
2 means for obtaining a corrupted image;
3 means for altering the corrupted image to obtain an altered image;

4 means for determining a plurality of parameters of a parametric mapping operator
5 for mapping the altered image into the corrupted image; and
6 means for utilizing the plurality of parameters to map the corrupted image into an
7 output image.

1 13. The system of claim 12 wherein the process comprises a de-echoing process and
2 the means for altering the corrupted image further comprises:
3 means for creating echoes of the corrupted image.

1 14. The system of claim 13 wherein the means for creating echoes of the corrupted
2 image further comprises:
3 means for convolving the corrupted image with a plurality of pulses wherein each
4 of the pulses are separated by a number of pixels.

1 15. The system of claim 14 wherein the means for utilizing the plurality of parameters
2 comprises:
3 means for adding to each of the number of pixels a multiplication of a strength
4 factor by a combination of values associated with a plurality of neighboring pixels.

1 16. The system of claim 15 wherein the means for determining a plurality of
2 parameters of a parametric mapping operator comprises:
3 means for calculating at least one similarity value for each of the neighboring
4 pixels; and
5 means for utilizing the at least one similarity value to produce at least one of the
6 plurality of parameters.

1 17. A scanning apparatus comprising:
2 a processor;

3 an operating system coupled to the processor; and
4 a scanning module coupled to the operating system wherein the scanning module
5 comprises logic for instructing the processor to perform the steps of:
6 obtaining a corrupted image;
7 altering the corrupted image to obtain an altered image;
8 determining a plurality of parameters of a parametric mapping operator for
9 mapping the altered image into the corrupted image; and
10 utilizing the plurality of parameters to map the corrupted image into an
11 output image.

1 18. The apparatus of claim 17 wherein the process comprises a de-echoing process
2 and the logic for altering the corrupted image further comprises logic for:
3 creating echoes of the corrupted image.

1 19. The apparatus of claim 18 wherein the logic for creating echoes of the corrupted
2 image further comprises logic for:
3 convolving the corrupted image with a plurality of pulses wherein each of the
4 pulses are separated by a number of pixels.

1 20. The apparatus of claim 19 wherein the logic for utilizing the plurality of
2 parameters comprises logic for:
3 adding to each of the number of pixels a multiplication of a strength factor by a
4 combination of values associated with a plurality of neighboring pixels.

1 21. A computer program product for utilizing a self-similarity technique to process an
2 image, the computer program product comprising a computer usable medium having
3 computer readable program means for causing a computer to perform the steps of:
4 obtaining a corrupted image;
5 altering the corrupted image to obtain an altered image;

6 determining a plurality of parameters of a parametric mapping operator for
7 mapping the altered image into the corrupted image; and

8 utilizing the plurality of parameters to map the corrupted image into an output
9 image.

1 22. The computer program product of claim 21 wherein the process comprises a de-
2 echoing process and the step of altering the corrupted image further comprises:

3 creating echoes of the corrupted image.

1 23. The computer program product of claim 22 wherein the step of creating echoes of
2 the corrupted image further comprises:

3 convolving the corrupted image with a plurality of pulses wherein each of the
4 pulses are separated by a number of pixels.

1 24. The computer program product of claim 23 wherein the step of utilizing the
2 plurality of parameters comprises:

3 adding to each of the number of pixels a multiplication of a strength factor by a
4 combination of values associated with a plurality of neighboring pixels.